

PART 2 - STREAMS
DRAFT 2006 INTEGRATED REPORT OF ASSESSED WATERS IN HAWAII
PREPARED UNDER CLEAN WATER ACT §303(d) AND §305(b)



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PART A. INTRODUCTION

The federal Clean Water Act (CWA) requires states to prepare and submit biennial reports of waterbodies that have been assessed. These reports have previously been separated into two final components. One report identifies waterbodies that are not expected to meet state water quality standards, even after application of technology-based effluent limitations. This component is referred to as the 303(d) List of Impaired Waters, the 303(d) List, or simply “The List.” States are required to obtain and review all existing and readily available surface water quality data and related information to compare against the state’s Water Quality Standards, and after applying listing criteria, make a decision as to the level of impairment for that waterbody. The List requirements apply to water bodies impaired by point and/or nonpoint sources of pollution and include a requirement for listing of those pollutants for which applicable water quality standards are exceeded. The second required report is prepared under section 305(b) of the Clean Water Act, where states are required to report biennially on the overall status of water quality, including waters that meet water quality standards and those that do not, then separate the waterbodies into one of 5 categories. EPA’s guidance for compiling the 2006 Integrated Report for 303(d)/305(b) ¹ urges states to integrate their 303(d) Lists and 305(b) Reports to ensure that consistent methodologies are applied in the preparation of both documents. EPA recommends that states sort their surface waters into 5 Categories according to the following guidance:

Category 1: All designated uses are supported, no use is threatened;

Category 2: Available data and/or information indicate that some, but not all of the designated uses are supported.

Category 3: There is insufficient available data and/or information to make a use support determinations.

Category 4: Available data and/or information indicate that at least one designated use is not being supported or is threatened, but a TMDL is not needed.

4a. A TMDL to address a specific segment/pollutant combination has been approved or established by EPA.

4b. A use impairment caused by a pollutant is being addressed by the state through other pollution control requirements.

4c. A use is impaired, but the impairment is not caused by a pollutant.

Category 5: Available data and/or information indicate that at least one designated use is not being supported or is threatened, and a TMDL is needed.

Hawaii State Department of Health (HIDOH) has sorted State surface waters into these five categories, insofar as sorting decisions are supported by the available data.

The 2006 List of Water Quality-Limited Segments, plus a priority ranking of listed waters, based on the severity of pollution and the uses of the waters, must be submitted by HIDOH to EPA for approval by April 1, 2006. Total Maximum Daily Loads (TMDLs) for all listed

¹ Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act (July 29, 2005)

pollutant/waterbody combinations are prepared in accordance with the priority rankings and the State-EPA schedule for submission for TMDLs. This schedule is negotiated on a continuing basis and is influenced by federal funding, state policy, data availability and a host of other factors, which vary from year to year.

Hawaii's 2004 List plus data collected from State water bodies over the past six years constitute the body of information reviewed for the 2006 Integrated Report. Decisions to list, de-list or not list a water body, for which data exist and have been reviewed, must be documented (40 CFR §130.7). The periodic listing process allows HDOH to list waterbodies, which after recent sampling, show exceedances; delist waterbodies (from the 303(d) section), which do not, after further sampling show exceedances for listed parameters; and more clearly articulate the parameters for which previously listed waterbodies should be listed. Additional information is also provided regarding attainment of known pollutants, pursuant to the 305(b) portion of the guidance as well. (See comments on the Executive Summary.)

HDOH's 2006 Integrated Report, 303(d) List of Impaired Waters contains a total of 93 stream segments and 218 coastal segments for which decisions of attainment or non-attainment reflect the waterbodies status as impaired. One stream was entirely delisted and there were many changes within the parameters of listed waterbodies. Usually, HDOH reports the previous year totals plus any new additions to the list. However, this year HDOH has segregated the decision units to classify the waters into waterbody types as described in HAR §11-54-1. Therefore, the comparison between the 2004 List and that presented in the 2006 Report is somewhat more complicated. HDOH has attempted to clearly articulate the fate of previously listed waterbodies in the table of changes. There were 17 new inland water segments listed for 2006.

PART B. BACKGROUND INFORMATION

B.1. Scope of Waters in the Integrated Report

This report covers all freshwaters of salinity less than 0.5 parts per thousand. The original visual non-attainment data reports from the 1998 303(d) List were revisited to determine the geographic scope of the original listings. Waterbodies were partitioned according to HAR §11-54-1 by type and then listings renewed accordingly. For the section authored by the Environmental Planning Office, decisions for estuaries are not included, except where original listings record visual exceedances for guidance purposes for the Brackish/Saline authors. Please see methodology section, Part C.2. for details regarding decision units for attainment decisions.

PART C. SURFACE WATER MONITORING AND ASSESSMENT

C.1. Assessment Methodology

Basic Attainment Decision Unit

As in previous Clean Water Act Section 303(d) listing cycles (and reflected in past/present 303(d) listing criteria, the basic (Tier I) attainment decision unit (hereafter "ADU" or "decision unit") for fresh inland Hawaii waters is the entire network (EN in report tables) of hydrologically connected freshwater segments (salinity <0.5 ppt) associated with a single listed stream, stream segment, or stream tributary. These freshwater segments, and thus the basic ADU, can include one or more waterbody types [as defined by Hawaii Administrative Rules Title 11 Chapter 54 (HAR §11-54; see Tables 2. and 3.), including but not limited to intermittent streams, reservoirs, and wetlands.

Tiered Approach

A tiered approach, linked with the assessment decision criteria first adopted in the 2002 303(d) listing cycle, is currently used to refine decision units for freshwater stream networks. Tier I ADUs are used for initial attainment decisions as governed by the current 303(d) listing criteria and for defining the geographic scope of "legacy" listings based on visual assessments. Tier II decision units encompass segments and partial segments that can be more narrowly defined and assessed based on existing monitoring locations, data, and boundaries between waterbody types, and are used for attainment decisions on a case-by-case basis. Tier III decision units are those established for TMDL development and other intensive monitoring and analysis purposes. Tier IV decision units are parts of Tier III decision units that can be defined based on the most detailed assessment information. Examples of Tier I, II, and III decision units are discussed below. Although no Tier IV freshwater decision units have been established for this reporting cycle, the 2006 Integrated Report guidance provides a summary of factors that can be used to structure the Tier IV decision process (see **Future Directions** below).

Decision Unit Rationale and Implementation

Decision units, in general, are intended to represent a combination of hydrologic and regulatory truth and are constrained by water quality monitoring logistics, resources and data. HIDOH's current focus on defining attainment decision units for streams is based on:

- (a) an assumption that streams as the most widespread fresh inland waterbody type and the most important fresh inland waterbody type to assess for reaching marine water quality goals;
- (b) the lack of numeric water quality standards criteria for conventional chemical and physical pollutants in most other fresh waterbody types; and
- (c) the unavailability of a complete comprehensive waterbody inventory and present limitations for monitoring and assessing all waterbodies, water quality criteria, and use attainment within each waterbody type.

ADUs for fresh inland Hawaii waterbodies do not include marine waters or inland brackish or saline waterbody types, such as estuaries and anchialine pools. Thus in the 2006 Integrated Report, the estuary components of previously listed stream systems (inland brackish waterbodies) are explicitly removed from the freshwater listing, and the freshwater tributary networks of these estuaries are explicitly added if they were not previously listed (see Table 1):

TABLE 1. Revised Decision Units for Stream Systems

Previously Listed Stream System/Estuary	Newly (N)/ Previously (P) Listed Freshwater Tributaries
Wailoa River (Hawaii)	Alenaio (P)
	Waiakea (P)
Kahaluu (Oahu)	Kahaluu (P)
Kiikii (Oahu)	Poamoho (N)
	Kaukonahua (N)
Paukauila (Oahu)	Opaeula (N)
	Helemano (N)
Anahulu (Oahu)	Kawailoa (N)
Waimea (Kauai)	Waimea (P)

As noted above, Tier II decision units encompass segments and partial segments that can be more narrowly defined and assessed based on existing monitoring locations, data, and boundaries between waterbody types. Tier II attainment decisions for three stream segments are included in the 2006 Integrated Report:

- Kalauao (Oahu) – Lack of appropriate upstream sampling locations prohibits a Tier I decision unit. Based on data from two downstream sampling locations and an assessment of upstream flow conditions, a Tier II decision unit is established in the stream segment from the H-I freeway down to the brackish receiving waters (Pearl Harbor Estuary).
- Moanalua (Oahu) - Lack of appropriate upstream sampling locations prohibits a Tier I decision unit. Based on data from two downstream sampling locations and an assessment of upstream flow conditions, a Tier II decision unit is established in the stream segment from HDOH's current upstream sampling location (3-3-12-U) down to the marine receiving waters (Keehi Lagoon).
- Hanamaulu (Kauai) – Lack of sufficient data from an upstream sampling location prohibits a Tier I decision unit. Based on data from a downstream sampling locations and an assessment of upstream flow conditions, a Tier II decision unit is established in the stream segment from HDOH's current upstream sampling location (2-3-12-U) down to the marine receiving waters (Hanamaulu Bay)

Decision unit boundaries for other fresh inland waterbody types are defined on a case-by-case basis when monitoring data and other assessment information is available, but generally encompass the entire waterbody. Attainment decisions for three non-stream waterbodies are included in the 2006 Integrated Report:

- Kawainui Marsh (Oahu) – Major wetland component of stream network separated as a Tier II decision unit from downstream receiving segment (Kawainui Stream) and upstream tributary segment (Kapaa Stream).
- Salt Lake (Oahu) – Tier I "legacy" decision unit (waterbody type under review).
- Wahiawa Reservoir (Oahu) - Impoundment of the north and south forks of Kaukonahua Stream separated as a Tier III decision unit from downstream receiving segment (Kaukonahua Stream) and upstream tributary segments.

Decision Unit Delineation, Naming, Coding, and Geolocation

Numerous conventions for naming, coding, and geolocating Hawaii waterbodies and decision unit boundaries discussed above have been designed and used over time. Building a comprehensive statewide waterbody inventory that standardizes these conventions for use by HDOH and others is an ongoing, intergovernmental resource management task (see **Future Directions** below). In the 2006 integrated Report, waterbody IDs for freshwater decision units are based upon the Hawaii Stream Assessment (HSA) Coding System (Hawaii Cooperative Park Service Unit, 1990). Modifications to the HSA include:

- All "s" code suffixes [identifying "stream systems," which by HDOH definition (HAR §11-54) includes estuaries] in the 2004 reporting are removed from the freshwater codings for this 2006 Integrated Report.
- New suffixes are added to stream codes to indicate non-stream components of the freshwater hydrologic network, e.g. "W" for wetland (see Kawainui Marsh, Oahu, 3-2-13-W) and "R" for reservoir (See Wahiawa Reservoir, Oahu, 3-6-06.02-R).
- Codes not included in the HSA report are created by employing the conventions described in the HSA report, consultation with related coding systems [primarily those employed by the State of Hawaii Department of Land and Natural Resources (Commission on Water Resource Management and Division of Aquatic Resources)], or using other specific rationale devised by HDOH.

Geolocation of freshwater decision units is based upon various public domain digital coverages, HDOH field data (GPS coordinates, station descriptions, field mapping, stream surveys, and stream assessments), and similar spatial location data submitted with third-party data packages.

Application of the criteria to attainment decisions

For streams, 303(d) listings apply to the entire freshwater (<0.5 parts per thousand-salinity) portion of a stream system (including all hydrologically-connected reaches) unless a case is documented in which smaller decision units are justified. Similarly, for other waterbody types, 303(d) listings apply to the entire freshwater (<0.5 parts per thousand-salinity) portion of the waterbody (including all hydrologically-connected reaches) unless a case is documented in which smaller decision units are justified. During the course of HDOH water quality monitoring and watershed analysis and planning, these hydrologic networks may be partitioned into smaller decision units and information may be gathered (including new monitoring data) to support attainment decisions for these smaller units.

We urge non-HDOH entities conducting similar monitoring, analysis, and planning activities to consult with HDOH about sampling designs and information management protocols that will facilitate HDOH's ability to use secondary data for attainment decisions. The entire hydrologic network within a watershed is the largest possible unit of decision units for inland fresh water bodies, and may include the boundaries of the following waterbody types as defined by HAR §11-54-1.

TABLE 2. Applicable Water Quality Criteria and Decision Unit Boundaries for Inland Fresh Waterbodies

Waterbody type¹	Applicable Water Quality Criteria²	Decision unit boundary³
Flowing seep	Basic/Recreational	Flowpath/Flow surface
Flowing spring	Basic/Recreational	Flowpath/Flow surface
Elevated wetland	Basic/Recreational/Wetland	1987 Corps delineation ⁴
Low wetland	Basic/Recreational	1987 Corps delineation ⁴
Intermittent stream	Basic/Recreational/Water Column/Bottom	Entire network or sub-network ⁵
Perennial stream	Basic/Recreational/Water Column/Bottom	Entire network or sub-network ⁵
Natural freshwater lake	Basic/Recreational	Lake
Freshwater impoundment ⁶	Basic/Recreational	Impoundment
Reservoir	Basic/Recreational	Reservoir
Ditch	Basic/Recreational	Ditch
Flume	Basic/Recreational	Flume
Drainage ditch ⁷	Basic/Recreational	Drainage ditch
Canal ⁷	Basic/Recreational	Canal

¹Inland freshwater (<0.5 ppt dissolved organic ion concentration) waterbody types as defined by Hawaii Administrative Rules Title 11 Chapter 54, Water Quality Standards (HAR §11-54-1). These definitions are applied to the definition of decision units.

²Basic criteria (Narrative "free of" and numeric standards for toxic pollutants) established by HAR §11-54-4; Specific (numeric) criteria for inland recreational waters established by HAR §11-54-8(a); Specific (numeric) criteria for stream water column established by HAR §11-54-5.2(b); Specific (numeric) criteria for stream bottom established by HAR §11-54-5.2(b)(2); Specific (numeric) criteria for elevated wetlands established by HAR §11-54-5.2(c).

³HAR §11-54-5.1(a) establishes a system of waterbody classification (waterbody class is defined by underlying land use classification) and associated designated uses.

⁴HAR §11-1: "... the identification and delineation of wetland boundaries shall be done following the procedures described in the U.S. Army Corps of Engineers Wetlands Delineation Manual (USACE 1987)."

⁵According to HAR §11-54-1 "'Stream system', means the aggregate of water features comprising or associated with a stream, including the stream itself and its tributaries, headwaters, ponds, wetlands, and estuary. A stream system is geographically delineated by the boundaries of its drainage basin or watershed." For stream attainment decision purposes, "associated" is interpreted as "hydrologically connected," and estuaries, ditches, flumes, drainage ditches, and canals are not included in the assessment.

⁶This waterbody type is not defined by rule but is included in the definition of "Standing waters."

⁷These waterbody types are not defined by rule but are included in the definition of "State waters."

HIDOH encourages monitoring, analysis, and planning activities that acknowledge and consider the regulatory boundaries between specific waterbody types, and that demonstrate a rationale for segmenting each waterbody into smaller decision units. The 2006 Integrated Report guidance provides a summary of factors to consider in developing these rationales:

- Partition waters to represent homogeneity in expected (v. actual) physical, biological, and chemical conditions
- Segmentation reflects *a priori* knowledge of flow, channel morphology, substrate, riparian conditions, adjoining land uses, confluence with other water bodies, and potential sources of pollutant loadings
- The expected natural variability of the measured criteria associated with the WQS
- Physical characteristics of the waterbody (segment)
- Time of travel of a parcel of water in the waterbody or segment
- The amount and type of data and information necessary to provide a reasonable accurate characterization of the criteria (or core indicators) associated with the designated uses in the segment or waterbody
- Any expected changes in significant influences in the watershed (Land use, point or nonpoint sources of pollutants)
- Any site-specific concerns such as patchy or unique habitat distribution patterns or biological population distributions
- Segments should be small enough to represent a relatively homogeneous parcel of water (with regard to hydrology, land use influences, pollutant loadings, etc.).

Methodology for Attainment Decisions (Are these the Priority Ranking

To provide both documentation and consistency when making listing decisions, HIDOH has utilized the same methodology as for preparing the 2004 List (Appendix A). The "2004 Listing & Delisting Criteria for Hawaii State Surface Waters Compiled under Clean Water Act 303(d)" describes the sources of Hawaiian water quality data, data quality requirements, limit on the age of data and sample sizes, and the amount of narrative information needed to sort data into one of three priority categories. Use of these standardized criteria will enable the HIDOH to periodically collect and/or assess data sets and make decisions on whether a water body should be listed, delisted or not listed in any subsequent listing cycle. The steadfast requirement for photographs is flexible for coastal areas. Photos are still required for inland waters to ensure location information is correct. Many places in Hawaii are named identically; photos help to identify the exact location of the sampling event.

Please note that the same information requirements apply to delisting as well as listing decisions. Data sets and supporting documentation were evaluated against both numeric and narrative criteria where applicable. For streams, listings generally apply to the entire freshwater (<0.5 parts per thousand-salinity) portion of a stream system unless a case is documented in which the watershed approach is not applicable.

State Water Quality Standards (WQS)² for conventional pollutants, such as nutrients and sediments, are expressed in a statistical format that presents criteria in the form of geometric means not to be exceeded by the geometric mean values computed from data sets. Two storm event allowances are included (the 10% geometric mean, not to be exceeded by more than 10% of the sample values, and the 2% geometric mean, not to be exceeded by more than 2% of the sample values). The WQS are further divided into "wet" and "dry" criteria, which, for streams, refer to the "wet" season as November through April and the remainder of the year as the "dry" season. For embayments and coastal waters, these terms refer to shorelines where more than 3 million gallons per day (mgd) of water are discharged from land per shoreline mile ("wet") and shorelines with less than 3 mgd discharge ("dry").

In accordance with the priority ranking and listing/delisting criteria (Appendix A), waterbodies were sorted into one of three priority categories. Priority 1 waters have sufficient data to clearly support a listing/delisting decision based on separate wet and/or dry conditions. Priority 2 waters have limited data, which requires HDOH to use a weight-of-evidence approach for listing/delisting decisions. Priority 3 waters have extremely limited data and require future monitoring before a listing decision can be made. For conventional pollutants, a minimum of ten samples from the wet season and/or ten samples from the dry season is required for Listing Priority 1 eligibility³. A minimum sample size of ten from a combined grouping of wet and dry conditions is required for Listing Priority 2a, and five to nine samples are required for eligibility for Listing Priority 2b. Any fewer than five samples result in the assignment of the water body and its numeric data into Listing Priority 3 (waters needing additional monitoring before a decision can be made to list, or not list).

When sample sizes are near ten, only the overall sample geometric mean can be computed. If larger sample sizes are available, the sample measurements can be sorted into 10%, 2%, wet and dry criteria tables as a function of the number of measurements available in any of these categories. FIGURE 1 illustrates the general process for priority ranking and listing/delisting conventional pollutants.

For toxic pollutants such as pesticides and heavy metals, which often require expensive analyses, a minimum sample size of three is required for eligibility for Listing Priority 1. Toxic pollutants are characterized by freshwater and saltwater acute and chronic concentration criteria and fish consumption criteria. FIGURE 2 describes the general process for priority ranking and listing/delisting toxic pollutants.

Criteria for indicator bacteria, used to evaluate waters for public health risks, are now both utilizing enterococci for inland and marine waters. Indicator bacteria counts are evaluated using data within a 25 to 30 day temporal increment and also contain applicable single sample maximum values.

Biological surveys of aquatic communities, fish consumption advisories and reports of contaminated sediments are also eligible sources of listing information. These surveys are most

² Hawaii Administrative Rules, Chapter § 11-54

³ These priority listings are also applicable to marine systems where the freshwater discharge volume determines wet and dry conditions.

likely to be placed in Listing Priority 3. Data sets for evaluation of narrative criteria must include at least 3 sampling events and represent conditions in both the wet and dry seasons. These narrative criteria may be evaluated using HDOH-approved habitat or biological assessment methodologies as long as they can be directly correlated to specific narrative criteria in HAR §11-54-04. Also, in accordance with HAR §11-54-04(b)(2)(A), acute toxicity standards for the contamination of sediment may be evaluated using broadly accepted standards such as those developed in Canada and New York, provided that HDOH deems them appropriate for use in the Hawaiian environment (CCME 1999; NYSDEC 1999). FIGURE 3 describes the general process for priority ranking and listing/delisting based on narrative criteria.

Basic methods for analysis remained the same among all data sources reviewed. Data were combined and sorted by station number based on the coding system adopted from the Hawaii Stream Assessment (COWRM and NPS 1990). HDOH is currently working on refining this coding system. Please see discussion of coding and decision units found in Part C.2. Data for all streams were separated into the three priority categories according to sample size. All data sets were distributed over time (within the six-year window from 1999-2005) and space (for inland waters, from upper and lower sampling sites. For instance, if several data values were available from one day and one site, the geomean would not be deemed sufficiently representative (temporally) to support a listing decision. More data would need to be collected to evaluate that waterbody. Photographs, visual assessments, written descriptions and appropriate QA/QC measures also should exist for the sampling sites.

Basic Process for Priority Ranking and Listing/Delisting Conventional Pollutants (FIGURE 1)

Priority 1 waterbodies were sorted by station number. The data were then reviewed to determine whether 10 samples existed for comparison to either the wet or the dry season standard. If a waterbody had 10 samples in the wet or dry condition or both, the samples were sorted by condition, and the geometric mean was calculated and evaluated against the corresponding wet and/or dry season standards. In Assessment Decision Table, the decision is represented by: A = attainment or N = non-attainment.

Likewise, Priority 2a waterbodies were sorted by station number. If at least 10 samples were spread between both wet and dry conditions, the data were combined and the geometric means for each waterbody were first evaluated against the wet season standard, then if >5 dry samples exist, tested against the dry season standard. If data from wet and dry seasons are combined because insufficient sample sizes exist to evaluate against the standards separately and the geometric mean of these data only exceeds the dry standard, a majority (>50%) of the raw data from dry seasons must exceed the dry standard to warrant listing. In Assessment Decision Table, the decision for combined data is represented by: Ac = attainment (combined data) or Nc = non-attainment (combined data).

For statistical significance, the “10% of the time” criteria are evaluated with a minimum sample size of 100 samples. The “2% of the time” criteria are evaluated with a minimum sample size of 500 samples. HDOH believes that environmental variability precludes the application of these criteria to smaller data sets due to the sizeable fluctuations that occur in natural systems. For

example, if there were 10 data points, only 1 would be required to exceed the 10% rule. If, by chance the sampling event occurred temporally near a significant rain event, the data would be biased toward an unrealistic exceedance. In many instances, due to Hawaii's storm prone events, this could be the case. If we applied the 10% or 2 % rule, many waterbodies would be listed in error. The geometric means method removes this bias in smaller sample sizes and HDOH considers it the best way to prevent statistical errors within the data set. In any event, the data sets for inland waters were not large enough to apply the 10% or 2% standards. .

Waterbodies with 5-9 samples were placed in the Priority 2b category, sorted by station number and then reviewed to determine if any of the samples exceeded the corresponding wet or dry season standards. If any of the samples from a particular waterbody exceeded the standard by a factor of 2 or more, the data set was reviewed to see if there were at least 5 samples from the corresponding wet or dry condition. If sufficient data were present, the geometric mean was calculated to determine whether the corresponding standard was exceeded by a factor of 2. In Assessment Decision Table, the decision for combined data exceedance by a factor of 2 is represented by: N1 = non-attainment (X2). Waterbodies and their corresponding conventional pollutant data that did not meet Priority 2 criteria were compiled for future monitoring in Priority 3 and assigned a question mark (?) in Assessment Decision Table.

FIGURE 1: Flow Chart of Priority Ranking and Listing/Delisting Process - Conventional Pollutants

(turbidity, total suspended solids, nutrients, chlorophyll a, temperature, dissolved oxygen, pH and indicator bacteria)

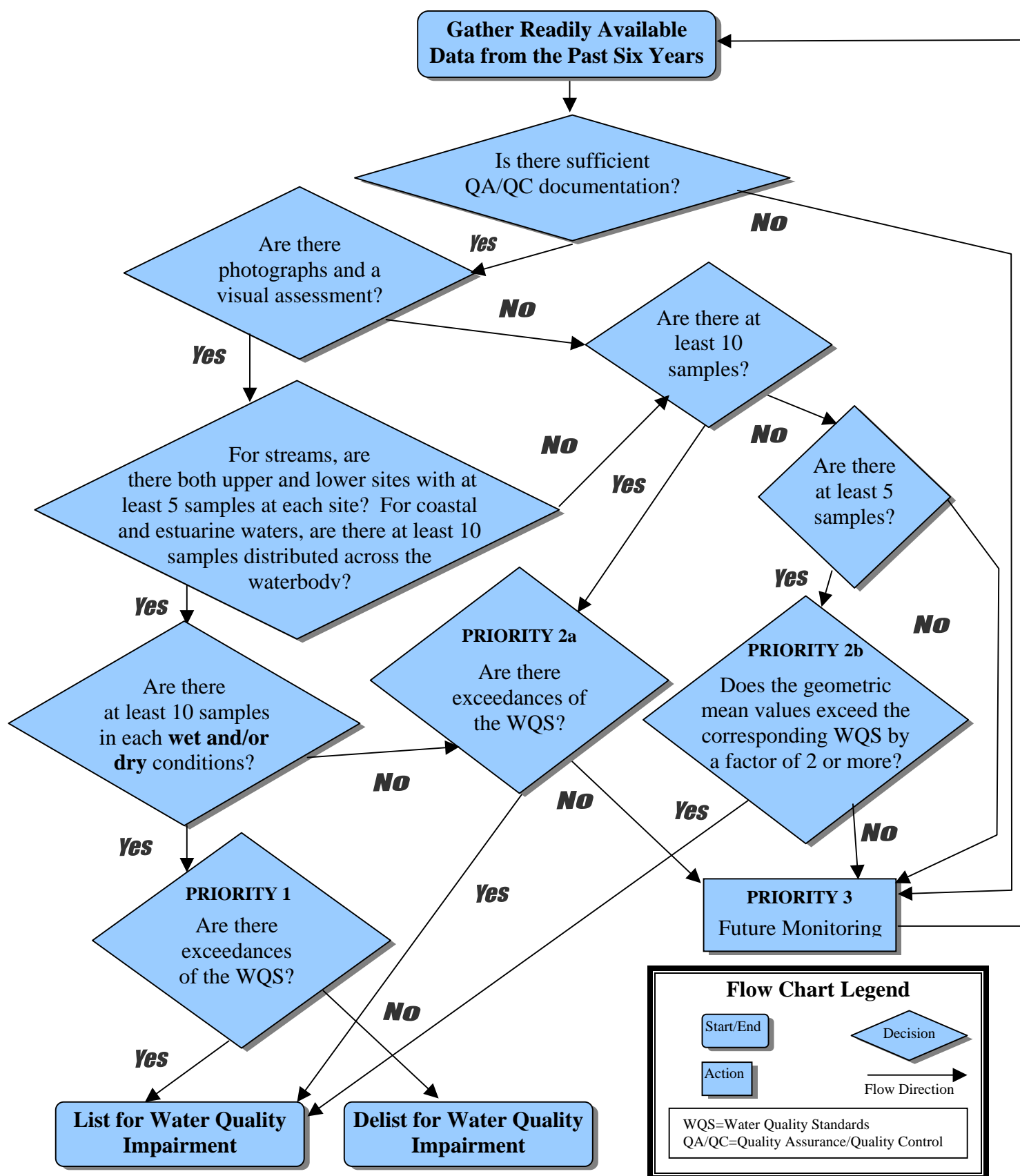


FIGURE 2: Flow Chart of Priority Ranking and Listing/Delisting Process - Toxic Pollutants

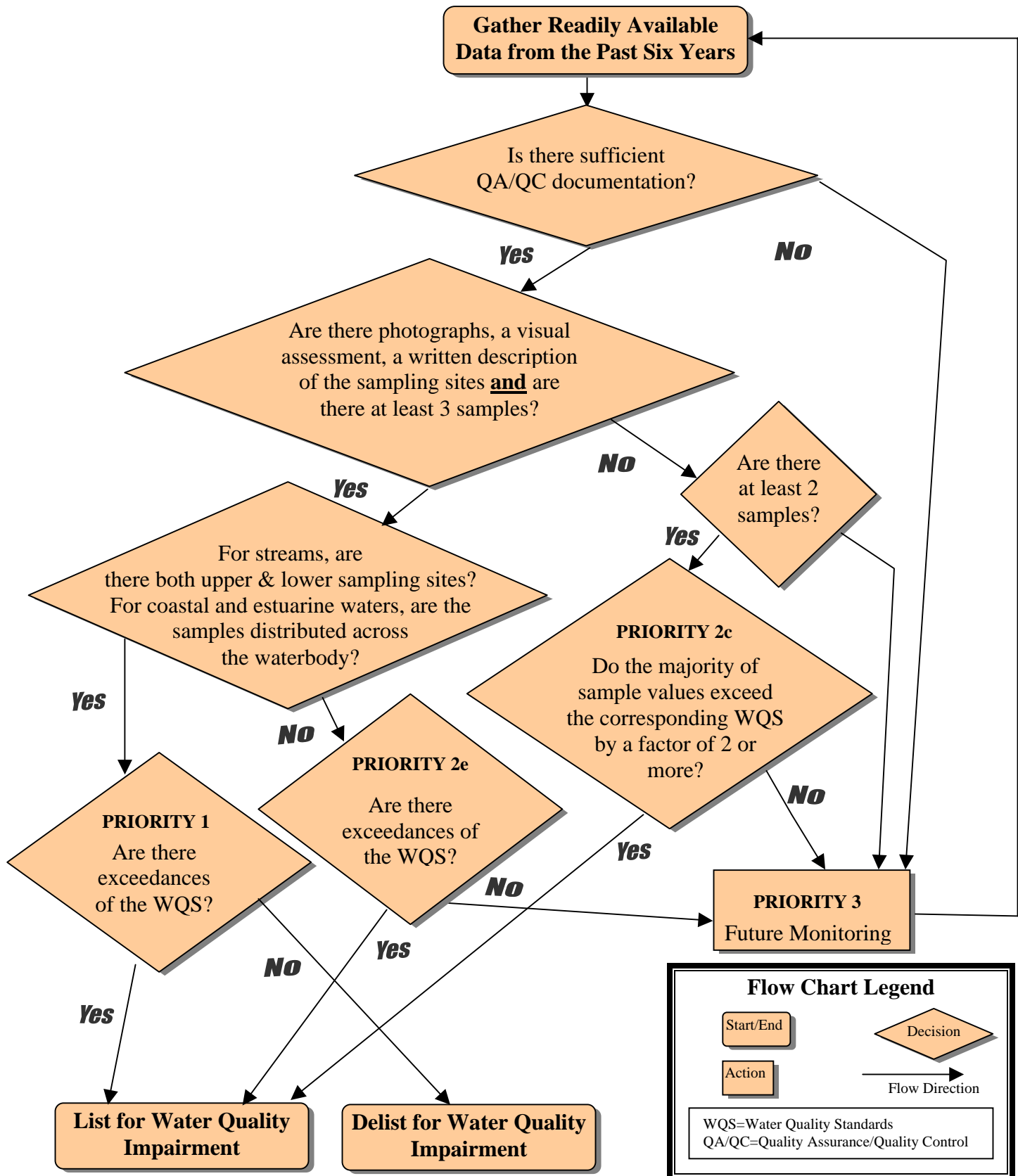
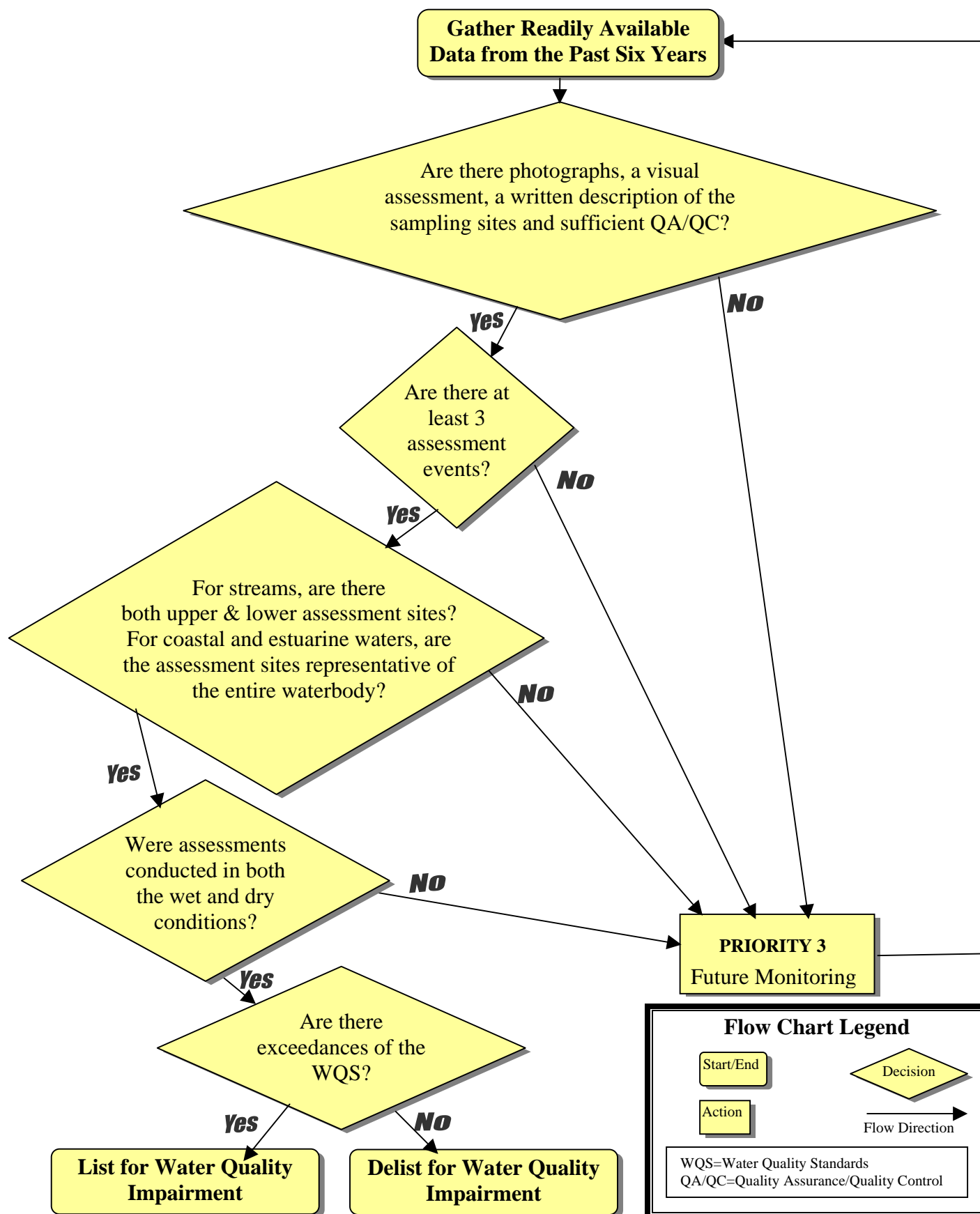


FIGURE 3: Flow Chart of Priority Ranking and Listing/Delisting Process - Narrative Criteria



Data Sources Reviewed

A formal call for data was published statewide in October 2005; a few responses were received. Environmental Planning Office staff also contacted a variety of organizations seeking water quality data that met minimum requirements. A summary of the communications log is attached as Appendix B. Appendix C summarizes the data submitted for consideration.

Major data sources reviewed include the following:

1. Data collected by HDOH's Clean Water Branch
Environmental Planning Office staff summarized data collected from streams and coastal monitoring sites by the Clean Water Branch, Monitoring Section. Lab samples and field samples were sorted separately using the same methodology.
2. Biological Assessments
There were no new biological assessments to review.
3. Other Environmental Assessments and Investigations and permit applications
There were no Environmental Assessments related to surface waters available for this report. Permit files were reviewed for the past 6 years. One data set was found within the files but significant issues were discovered and the data contained inadequate QA/QC to make the data defensible.
4. Other Data Sources

Hanalei Watershed areas

Data for turbidity, nutrients and enterococcus from the Hanalei Watershed Hui were reviewed for this report.

Heeia Stream, Kapaa Stream and Ka'elepulu area.

Under the supervision of Drs. Leticia Colmenares and Dave Krupp, Windward Community College students have been sampling water quality parameters at a number of sites along Heeia, Haiku and Kapaa, including stream, estuary and coastal areas sampling sites. Data are available at <http://www.wcc.hawaii.edu/usda/Heeia> and <http://www.wcc.hawaii.edu/water/>.

Quality Assurance/Quality Control Considerations

Quality Assurance/Quality Control (QA/QC) procedures document data quality by describing data collection and analysis procedures. QA/QC basically answers the questions "Where did those numbers come from, and why should anyone believe them?" HDOH's Clean Water Branch, Environmental Planning Office, and Laboratory operate under the terms of a "Quality Management Plan for Surface Water Quality Monitoring," approved by EPA Region IX and dated December 9, 1999.

The USGS/NAQWA program operates under written QA/QC plans approved by the USGS.

Various other submitted data were evaluated as to containing accessible written procedures and lab assurance documentation to validate data.

C.2 Assessment Results

C.2.1 Review of Data

Inland Streams

Seventy-four streams throughout the islands had sufficient data to evaluate whether an exceedance of the Water Quality Standards occurred. Forty-four of these streams were already listed on Hawaii's 2004 303(d) List for at least one parameter. The majority of the data used for the assessment of fresh waters came from the CWB database.

Bacterial Data

The current WQS require the use of enterococci as the indicator bacteria for evaluating public health risks in inland waters; however, no new data was available for this parameter in inland waters. CWB efforts have been focused on coastal areas. There were no new listings for bacteria based on the data for from the Clean Water Branch.

Other Data Sources

Hanalei River - Kauai

Data for nutrients and enterococci were available from the Hanalei Watershed Hui for listing/delisting and prioritization decisions. Data for fresh, brackish and marine waters were of sufficient quality and were incorporated into the master table.

Heeia, Haiku and Kapaa Streams

Sufficient data and QA/QC procedures were available from Dr. Letty Colmenares of Windward Community College for listing/delisting and prioritization decisions. The data represented sampling events over several years in three watersheds. The data agree with those collected by the Clean Water Branch of HDOH (where available).

C.2.2. Hawaii's 2006 303(d) List

The 2006 303(d) List includes the waterbodies on the revised 2004 List of Impaired Waterbodies minus one stream being delisted plus an additional 17 newly listed streams. Complete assessment information is found in Assessment Decision Table, found as a separate chapter of this report. Station numbers and names are based on the Hawaii Stream Assessment (CWRM and NPS 1990). Waterbodies were prioritized as High, Medium or Low for Total Maximum Daily Load (TMDL) development. High, medium or low priorities were assigned to each water based on number of parameters listed and severity of exceedances.

TMDL Development Priorities:

TMDLs have been established for the Ala Wai Canal (revised 2002), Waimanalo Stream (approved 2001) and Kawa Stream (revised 2005). TMDLs for listed streams in Kauai's Nawiliwili Bay Watershed (Nawiliwili, Puali, and Huleia); Oahu's Pearl Harbor Watershed (Waikale, Kapakahi, Waiawa, Waimano, Waimalu, Aiea, Kalauao, and Halawa); Kapaa, Kamooalii, and Kaneohe streams (Oahu); and Waiakea and Alenaio streams (Hilo Bay Watershed, Hawaii) are scheduled for completion in 2007. TMDLs for the Hanalei stream system (Kauai), Kaelepulu stream system (Oahu), and N. and S. Fork Kaukonahua Stream (Oahu) are expected to be completed in 2008, with ongoing phased TMDL development in Kaukonahua receiving waters (Wahiawa Reservoir, lower reaches of Kaukonahua Stream, Kiikii estuary, and Kaiaka Bay). TMDL development for S. Molokai coastal waters began in 2006 (basic data collection by the U.S. Geological Survey Pacific Islands Water Science Center)

In each case, TMDLs will be established for pollution by sediment, nutrients, and bacterial indicators. Other detected pollutants in these waterbodies (e.g. trash in Kapakahi; metals in Kapaa; and pathogens, metals, organochlorine pesticides and lead in the Ala Wai Canal) are not currently scheduled for TMDL development. Depending on the availability of funding and community partnerships, HDOH will begin developing TMDLs for the Iao Stream (Maui), Nuuanu and Kalihi streams (Oahu) and other priority waterbodies in subsequent years.

The 2006 List is shown in ASSESSMENT DECISION TABLE (a separate chapter in this report); all changes to the 2004 list are graphically highlighted (see table legend) throughout the 2006 List. Waters previously listed on the basis of legacy data or visual assessment will remain on the list until there are sufficient numeric data to validate or invalidate previous listing using listing Priority 1 criteria (see p14, or Appendix A). Factors considered for prioritizing waters on the 303(d) list as High (H), Medium (M) or Low (L) include the following:

- severity of pollution (number of pollutants listed and degree that levels of pollutants exceed the standard),
- uses of the waters,
- type and location of waterbody,
- degree of public interest and
- vulnerability of particular waters,
- NPDES permitting schedule for facilities that discharge to the waterbody or its upstream tributaries

Assignment of Streams into EPA's Five-Part Categorization Scheme

In the process of identifying waters that meet the listing criteria for the Impaired Waters List, HDOH was also able to indicate where waters should be placed in the categories recommended in EPA's integrated 303(d)/305(b) guidance (<http://www.epa.gov/owow/tmdl/2006IRG/#documents>).

- (1) All designated uses are met;
- (2) Some designated uses are met, but data are insufficient to support a decision on the remaining designated uses;
- (3) Data are insufficient to support a decision on whether any designated uses are met;
- (4) A waterbody is impaired or threatened but a Total Maximum Daily Load (TMDL) is not needed if
 - a. A TMDL has been completed for all listed parameters;
 - b. Required control measures are expected to result in Water Quality Standards (WQS) attainment in a reasonable period of time;
 - c. The impairment or threat is not caused by a pollutant;
- (5) Water is impaired or threatened and a TMDL is needed.

Hawaii's Designated Use Attainment and Water Quality Standards Alignment

Hawaii State Water Quality Standards, Chapter §11-54 are not segmented into designated use support delineations. Standards are specified by classifications of waterbody type, not by designated use. In many cases, the waterbody type has more than one classification, which, in turn, infers a different designated use. For example, inland fresh waters can range from Class 1 waters that *"remain in their natural state as nearly as possible with an absolute minimum of pollution from any human-caused source"* to the less stringent expectations of Class 2 which *"protect their use for recreational purposes, the support and propagation of aquatic life, agricultural and industrial water supplies, shipping, and navigation."* Class 1 waterbodies can be further classified as Class 1a or 1b. *"The uses to be protected in class 1.a waters are scientific and educational purposes, protection of native breeding stock, baseline references from which human caused changes can be measured, compatible recreation, aesthetic enjoyment, and other nondegrading uses which are compatible with the protection of the ecosystems associated with waters of this class."* *"The uses to be protected in class 1.b waters are domestic water supplies, food processing, protection of native breeding stock, the support and propagation of aquatic life, baseline references from which human-caused changes can be measured, scientific and educational purposes, compatible recreation, and aesthetic enjoyment."* Less stringent Class 2 waters are those with *"the uses to be protected in this class of waters are all uses compatible with the protection and propagation of fish, shellfish, and wildlife, and with recreation in and on these waters."*

While these definitions sound similar in content, the key components refer to the non-degrading reference condition and native breeding stock aspects, which can only be determined by biological criteria. The state is currently collecting baseline information to develop applicable biological criteria to be added to the WQS, although this is a 5 to 10-year process that is subject to public review. Refining the WQS to add biological criteria and to evaluate attainment of designated uses within waterbodies may be proposed in future revisions of the WQS. WQS will need significant adjustments

to ascertain attainment of designated uses through sampling of conventional and toxic pollutants. Hawaii's WQS revisions are scheduled for evaluation and review on a 3-year cycle and subject to public review and comment.

Classification of the States Waterbodies into EPA Categories

Determining whether a water body can be appropriately classified in Category 1, "All designated uses are met," requires extensive knowledge of the health and status of the water body. Collection of physical, chemical and biological data indicating that all water quality standards and uses are being attained is fundamental to this classification. At this time, HDOH has determined that not enough data has been collected to assign any waterbody to this category. HDOH considers this category to be mutually exclusive.

Category 2 contains 17 streams that have data that show attainment of some of the water quality standards; however, none of the data sets are complete and/or consistent with the state's listing methodology. Therefore, HDOH cannot determine whether all designated uses are met. HDOH proposes the following inland water bodies to be listed in the Category 2: Pukiahae, Kalaoa, Paheehee, Nanue and Hakalau streams on Hawaii Island, Honokohau, Hanawi, Alelele and Kahakuloa streams on Maui, Pelekunu, Wailau and Honouliwai streams on Molokai, Punaluu Stream on Oahu, and Hanakapiai, Limahuli, Wainiha and Waioli streams on Kauai. Although limited numerical data exists for Nanue and Hakalau streams on Hawaii Island, Hanawi and Alelele streams on Maui, Wailau on Molokai, and Hanakapiai and Limahuli streams on Kauai, these streams are included in Category 2 due to their status as reference sites for biological resources as utilized in the Hawaii Stream Bioassessment Protocol (HSBP, 2002).

All of the state's waterbodies fall into Category 3, "data are insufficient to support a decision..." for at least one of the designated uses. HDOH reasons that different standards are needed to apply the designated use attainment assertions inherent in this category. Waterbodies may be cross-categorized into Category 2 and Category 3 if some designated uses are supported but there is insufficient data and/or information to make a support determination for other uses. The waterbodies that are currently 303(d) listed for specific water quality parameters, but need more data to determine compliance with other water quality standards or use attainments, are sorted into Categories 3 and 5.

Only 3 waterbodies are in Category 4a. Waimanalo and Kawa stream TMDLs have been approved for all listed parameters, and some listed parameters have been approved for the Ala Wai Canal Estuary. As previously mentioned, all Hawaii streams remain in Category 3, the Ala Wai Canal Estuary also has listed parameters not addressed by a TMDL, therefore, the estuary will also retain the Category 5 listing as well. There are no waterbodies in Category 4b; where control measures are expected to result in WQS attainment in a reasonable period of time. There may be potential for some waterbodies to be assigned to Category 4c. More study is required to determine if the cause of impairments or threats to many of Hawaii's waterbodies is caused by any pollutant or caused by other factors such as invasive species or water diversions. Some candidate Category 4c water bodies are listed in Appendix C where a Use Attainability Assessment shows diversions or canal modifications exist. An evaluation and full inventory must be made establishing the existing uses of surface waters and what designated uses correspond.

Many streams listed in the table have multiple categories assigned. HDOH's decision to list waterbodies into several categories stem from the lack of specific standards for some designated uses.

C.2.3. Explanation of Major Changes and Delisting

For streams, all listing/delisting changes were based on the data collected by HDOH Clean Water Branch, Hanalei Watershed Hui and/or Windward Community College.

Many changes were initiated to clarify geographical accuracy of the listing and representational data available for analysis. These changes were based on the initial visual assessments performed for the 1998 303(d) List of Impaired Waters. HDOH revisited the reports to clarify geographical scope of the assessments and adjusted the Assessment Decision Units (ADUs) accordingly to segregate differing waterbody types and applicable Water Quality Standards (WQS). Please see the sections on decision units, Part C.2., and future direction, Part C.2.4., for more information on geographical scope changes.

Several streams are newly listed as the sampling data of conventional pollutants increases. Many new streams were listed on Kauai on the basis of newly gathered data. Other changes are based on modification/refinement of delineating geographic scope. Please refer to Table 3 for full details.

Of special note on each island:

Hawaii

- Kolekole was entirely delisted based on numerical data that showed attainment of WQS.

Maui

- Ukumehame was delisted for Turbidity (dry season), but was newly listed for Nitrite/Nitrate (dry season).
- Waikapu was newly listed for Turbidity (dry season).

Molokai

- Waialua was newly listed for Turbidity (dry season).

Oahu

- Many new listing for Turbidity and Nutrients (Total Nitrogen, Nitrite/Nitrate, and Total Phosphorus)

Kauai

- New listings for Limahuli, Manoa, Waipa, Hanalei, Kilauea, Moloaa, Papaa, Anahola, Wailua, Hanamaulu, Nawiliwili, Puali, Huleia, Waikomo, Lawai, Wahiawa, Waimea

TABLE 3. Detailed Summary of Changes

Segment	Waterbody ID*	2004 303(d) Listing	2006 303(d) Listing	Decision Action	Summary Rationale
Hawaii					
Halelua	8-1-10		Turb - Wet	New Listing	New numerical Data
Wailoa/Waipio	8-1-44		Total N - Dry	New Listing	New numerical Data
Wailoa/Waipio	8-1-44		Total P - Dry	New Listing	New numerical Data
Wailoa/Waipio	8-1-44		Total N - Wet	New Listing	New numerical Data
Wailoa/Waipio	8-1-44		NO2-NO3 - Wet	New Listing	New numerical Data
Kolekole	8-2-33	Nutrients - Dry (visual)		Delisted	New numerical Data
Kapehu	8-2-37	O	NO2-NO3 - Dry	New Listing	New numerical Data
Kaieie	8-2-49	Nutrients - (visual)	Nutrients -Wet (visual)	Modified	New numerical Data removes Dry season component
Kapue	8-2-53		Turb - Dry	New Listing	New numerical Data
Honolii	8-2-56	Nutrients - Dry (visual)		Delisted	New numerical Data
Honolii	8-2-56	Turb - Dry (visual)	Turb - Dry	Modified	New numerical Data replaces visual basis for listing
Mali	8-2-57		Turb - Dry	New Listing	New numerical Data
Wailuku	8-2-60	Nutrients - Dry (visual)	NO2-NO3 - Dry	Modified	New numerical Data replaces visual basis for listing
Wailoa River	8-2-61	Wailoa River	Waiakea 8-2-61 Wailoa River 8-2-61-E	Modified scope	Remove from Streams listings (brackish water)*
Maui					
Ukumehame	6-1-01		NO2-NO3 - Dry	New Listing	New numerical Data
Ukumehame	6-1-01	Turb - Dry		Delisted	New numerical Data
Waihee	6-2-07	Nutrients - (visual)	Nutrients -Wet (visual)	Modified	New numerical Data removes Dry season component
Waikapu	6-2-10		Turb - Dry	New Listing	New numerical Data
Molokai					
Waialua	4-2-04		Turb - Dry	New Listing	New numerical Data
Oahu					
Waialele	3-1-08		Turb - Wet	New Listing	New numerical Data

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Segment	Waterbody ID*	2004 303(d) Listing	2006 303(d) Listing	Decision Action	Summary Rationale
Oahu – cont.					
Kahana	3-1-18		NO2-NO3 - Dry	New Listing	New numerical Data
Kahana	3-1-18		Turb - Dry	New Listing	New numerical Data
Waikane	3-2-02		NO2-NO3 - Dry	New Listing	New numerical Data
Waikane	3-2-02		NO2-NO3 - Wet	New Listing	New numerical Data
Waiahole	3-2-04		NO2-NO3 - Dry	New Listing	New numerical Data
Waiahole	3-2-04		Total P - Dry	New Listing	New numerical Data
Kaala	3-2-05		Turb - Dry	New Listing	New numerical Data
Kahaluu	3-2-07	3-2-07s	Kahaluu 3-2-07.02 Kahaluu 3-2-07-E	Modified scope	Remove estuary segment from Streams listing*
Waihee	3-2-07.01	Nutrients - (visual)	Nutrients - Wet (visual)	Modified	New numerical Data removes Dry season component
Waihee	3-2-07.01	Nutrients - (visual)	NO2-NO3 – Dry Total N - Dry	Modified	New numerical Data replaces visual basis for listing
Waihee	3-2-07.01		Turb - Dry	New Listing	New numerical Data
Kahaluu	3-2-07.02		NO2-NO3 - Dry	New Listing	New numerical Data
Heeia	3-2-08		Turb - Wet	New Listing	New numerical Data
Heeia	3-2-08		NO2-NO3 - Dry	New Listing	New numerical Data
Heeia	3-2-08		Total N - Dry	New Listing	New numerical Data
Kaneohe	3-2-10		Turb - Dry	New Listing	New numerical Data
Kapaa/Kawainui	3-2-13*	3-2-13s	K. Stream 3-2-13 Kapaa Stream 3-2-13-Kapaa K. Marsh 3-2-13-W	Modified	Clarifies geog scope of prior listing
Maunawili	3-2-13.01	3-2-13	3-2-13.01	Modified	Clarifies geog scope of prior listing
Kapaa	3-2-13*		Lead	New Listing	New numerical Data
Palolo	3-3-07.01.1	3-3-07s	3-3-07.01.1	Modified	Clarifies geog scope of prior listing
Nuuanu	3-3-09		NO2-NO3 - Dry	New Listing	New numerical Data
Nuuanu	3-3-09		Total P - Dry	New Listing	New numerical Data
Nuuanu	3-3-09		TSS - Dry	New Listing	New numerical Data
Nuuanu	3-3-09	Turb (visual)	Turb - Dry	Modified	New numerical Data
Nuuanu	3-3-09	Turb (visual)	Turb - Wet	Modified	New numerical Data
Moanalua	3-3-12	3-3-12	3-3-12-01	Modified	Clarifies geog scope of prior listing

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Segment	Waterbody ID*	2004 303(d) Listing	2006 303(d) Listing	Decision Action	Summary Rationale
Oahu – cont.					
Moanalua	3-3-12	Nutrients - (visual)	Total N - Dry	Modified	New numerical Data
Moanalua	3-3-12	Nutrients - (visual)	Total N - Wet	Modified	New numerical Data
Moanalua	3-3-12	Turbidity - (visual)	Turb - Dry	Modified	New numerical Data replaces visual basis for listing
Aiea	3-4-03		Total N - Wet	New Listing	New numerical Data
Aiea	3-4-03		NO2-NO3 - Wet	New Listing	New numerical Data
Kalauao	3-4-04		Total N - Dry	New Listing	New numerical Data
Kalauao	3-4-04		NO2-NO3 - Dry	New Listing	New numerical Data
Waiawa	3-4-06	Nutrients - (visual)	Nutrients - Dry (visual)	Modified	New numerical Data removes Wet season component
Waikele	3-4-10	Nutrients - (visual)	NO2-NO3 - Dry	Modified	New numerical Data
Waikele	3-4-10	Nutrients - (visual)	Total N - Dry	Modified	New numerical Data
Waikele	3-4-10	Nutrients - (visual)	NO2-NO3 - Wet	Modified	New numerical Data
Waikele	3-4-10	Nutrients - (visual)	Total N - Wet	Modified	New numerical Data
Kiikii	3-6-06	3-6-06s	Poamoho 3-6-06.01 Kaukonahua 3-6-06.02 Kiikii 3-6-06-E	Modified scope	Remove from Streams listings (brackish water)*
Poamoho	3-6-06.01	3-6-06s	Nutrients - (visual) Turb - (visual)	Modified	Clarifies geog scope of prior listing
Kaukonahua	3-6-06.02	Nutrients - (visual) 3-6-06s	NO2-NO3 - Dry Total N - Dry Turb - Dry	Modified	Clarifies geog scope of prior listing. New numerical data replaces visual basis for listing.
Kaukonahua	3-6-06.02	Nutrients - (visual) 3-6-06s	NO2-NO3 - Wet Total N - Wet Turb - Wet	Modified	Clarifies geog scope of prior listing. New numerical data replaces visual basis for listing.
Wahiawa Reservoir	3-6-06.02-R*	3-6-06s	3-6-06.02-R*	Modified scope	Clarifies geog scope of prior listing
S. Fork Kaukonahua	3-6-06.02.1*	3-6-06s	3-6-06.02.1*	Modified scope	Clarifies geog scope of prior listing
N. Fork Kaukonahua	3-6-06.02.2*	3-6-06s	3-6-06.02.2*	Modified scope	Clarifies geog scope of prior listing
Paukaula	3-6-07	3-6-07s	Helemano 3-6-07.01 Opauala 3-6-07.02 Paukaula 3-6-07-E	Modified scope	Remove from Streams listings (brackish water)*
Anahulu	3-6-08	3-6-08s	Kawailoa 3-6-08.01 Anahulu 3-6-08-E	Modified scope	Remove from Streams listings (brackish water)*

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Segment	Waterbody ID*	2004 303(d) Listing	2006 303(d) Listing	Decision Action	Summary Rationale
KAUAI					
Limahuli	2-1-12		NO2-NO3 - Dry	New Listing	New numerical Data
Manoa	2-1-13		Turb - Dry	New Listing	New numerical Data
Manoa	2-1-13		Turb - Wet	New Listing	New numerical Data
Waipa	2-1-17		Turb - Dry	New Listing	New numerical Data
Hanalei	2-1-19	Turb - Dry (visual)	Turb - Dry	Modified	New numerical Data replaces visual basis listing
Hanalei	2-1-19	Enterococci		New Listing	New numerical Data
Kilauea	2-1-28		Turb - Dry	New Listing	New numerical Data
Moloaa	2-1-34		Turb - Dry	New Listing	New numerical Data
Moloaa	2-1-34		Turb - Wet	New Listing	New numerical Data
Papaa	2-1-35		Total N - Dry	New Listing	New numerical Data
Papaa	2-1-35		NO2-NO3 - Dry	New Listing	New numerical Data
Papaa	2-1-35		Turb - Dry	New Listing	New numerical Data
Anahola	2-2-01		Turb - Dry	New Listing	New numerical Data
Anahola	2-2-01		Turb - Wet	New Listing	New numerical Data
Kapaa	2-2-04	Turb - Dry (visual)	Turb - Dry	Modified	New numerical Data replaces visual basis listing
Wailua	2-2-08		Turb - Dry	New Listing	New numerical Data
Hanamaulu	2-2-12		Turb - Dry	New Listing	New numerical Data
Nawiliwili	2-2-13		NO2-NO3 - Dry	New Listing	New numerical Data
Nawiliwili	2-2-13		Total N - Dry	New Listing	New numerical Data
Puali	2-2-14		NO2-NO3 - Dry	New Listing	New numerical Data
Puali	2-2-14		Total N - Dry	New Listing	New numerical Data
Puali	2-2-14		Turb - Dry	New Listing	New numerical Data
Puali	2-2-14		Total N - Wet	New Listing	New numerical Data
Puali	2-2-14		Turb - Wet	New Listing	New numerical Data
Huleia	2-2-15		NO2-NO3 - Dry	New Listing	New numerical Data
Huleia	2-2-15		Total N - Dry	New Listing	New numerical Data
Huleia	2-2-15	NO2-NO3 - Wet		Delisted	New numerical Data
Waikomo	2-3-02		Total N - Dry	New Listing	New numerical Data
Waikomo	2-3-02		NO2-NO3 - Dry	New Listing	New numerical Data

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Segment	Waterbody ID*	2004 303(d) Listing	2006 303(d) Listing	Decision Action	Summary Rationale
KAUAI – cont.					
Waikomo	2-3-02		Turb - Dry	New Listing	New numerical Data
Waikomo	2-3-02		Total N - Wet	New Listing	New numerical Data
Waikomo	2-3-02		NO2-NO3 - Wet	New Listing	New numerical Data
Waikomo	2-3-02		Turb - Wet	New Listing	New numerical Data
Lawai	2-3-04		Total N - Dry	New Listing	New numerical Data
Lawai	2-3-04		Turb - Dry	New Listing	New numerical Data
Wahiawa	2-3-06		Total N - Dry	New Listing	New numerical Data
Wahiawa	2-3-06		NO2-NO3 - Dry	New Listing	New numerical Data
Wahiawa	2-3-06		Turb - Dry	New Listing	New numerical Data
Wahiawa	2-3-06		Total N - Wet	New Listing	New numerical Data
Wahiawa	2-3-06		NO2-NO3 - Wet	New Listing	New numerical Data
Wahiawa	2-3-06		Turb - Wet	New Listing	New numerical Data
Waimea	2-4-04s	2-4-04s	Waimea Stream 2-4-04 Waimea Est. 2-4-04-E*	Modified	Remove from Streams listings (brackish water)*
Waimea	2-4-04	Turb - (visual) (2-4-04s)	Turb - Dry	Modified	Clarifies geog scope of prior listing. New numerical data replaces visual basis for Dry season listing.
Waimea	2-4-04	Turb - (visual) (2-4-04s)	Turb - Wet (visual)	Modified	Clarifies geog scope of prior listing. Visual basis for Wet season listing remains.
Waimea	2-4-04		NO2-NO3 - Dry	New Listing	New numerical Data

**Waterbody IDs follow the Hawaii Stream Assessment (HSA) Coding System (Hawaii Cooperative Park Service Unit, 1990).

In HSA Coding System, code suffix "s" identifies "stream system," which by DOH definition (HAR 11-54) includes estuaries.

Thus all "s" codings are removed from the freshwater codings in the 2006 Integrated Report.

Codings marked by an asterisk (*) in this table require clarification and modification not available in the 1990 HAS publication.

Please see the Freshwater Decision Units Rationale for further discussion of waterbody delineation, naming, coding, and georeferencing conventions.

C.2.4. Future Directions

Decision Units

The evolving framework for defining and georeferencing attainment decision units, waterbody segments, and NHD reaches for fresh inland Hawaii waters must have a foundation of hydrologic and regulatory truth. How we build upon this foundation is determined by our information management technology and skills and our water quality monitoring capacity and strategy. To build upon this foundation during upcoming assessment cycles, we will continue (1) modifying our watershed and waterbody delineation and coding systems to better incorporate and reflect hydrologic and regulatory truth; (2) improving our information management technology and procedures to facilitate data integration and georeferencing; (3) expanding our monitoring capacity to generate more, higher-quality data; and (4) developing our comprehensive surface water quality monitoring strategy to guide our use of this monitoring capacity for making the best possible attainment decisions while also achieving our other monitoring objectives.

The following discussion of this framework marks the current status of these efforts. Priorities for the next assessment cycle (2008 Integrated Report) include (1) completing modifications to watershed delineations and the watershed coding system; (2) beginning a comprehensive inventory of all fresh inland waterbodies, including the modification of waterbody delineation and coding protocols to be used in the inventory process; (3) completing revisions to our Quality Assurance Program Plans for surface water monitoring and analysis; and (4) updating the Comprehensive Surface Water Quality Monitoring Strategy to focus the results of these efforts on our monitoring needs and monitoring plans for attainment decision-making.

NHD reaches for fresh inland Hawaii waterbodies are intended to represent a combination of hydrologic and regulatory truth and are defined from confluence to confluence within a single waterbody type (type as established by water quality standards). For the purpose of NHD reach indexing, confluences include (a) the intersection of two or more sections (e.g. tributaries, forks, branches, arms) of a waterbody (single type) and (b) the intersection of two or more waterbodies of different types (e.g. "intermittent stream" and "perennial stream," "ditch" and "perennial stream," "spring" and "wetland"). However, intersections of fresh inland waterbodies with various (i) outfalls, (ii) other discharge structures, and (iii) overland and subsurface flow paths, where these (i, ii, and iii) are principally designed or functioning to convey storm runoff and ephemeral subsurface flow into fresh inland waterbodies, are not considered confluences. A single NHD reach is regulated by one or more water quality standards (see **Waterbody segments** below).

Waterbody segments for fresh inland Hawaii waterbodies are intended to represent regulatory truth and are defined as the portion of a single NHD reach that is regulated by a single water quality standard (meaning that it is within a single waterbody type and class). Because waterbody class is defined solely by underlying State Land Use classification, a single NHD reach may span part or all of one or more waterbody segments (and thus may be regulated by one or more water quality standards). A single waterbody segment may form all or part of an attainment decision unit, and a single attainment decision unit may include one or more waterbody segments.

TABLE 4. Descriptive Information for Each Waterbody Segment

Waterbody type ¹	Segment				
	Identifier ²	type	size and unit of measurement	name or location on NHD	designated uses
Flowing seep	TBD	same as waterbody type	TBD	TBD	defined by segment's waterbody class (1.a., 1.b., or 2.) for all waterbody types
Flowing spring	TBD		TBD	TBD	
Elevated wetland	TBD		ha	TBD	
Low wetland	TBD		ha	TBD	
Intermittent stream	HSA stream code		m	Name_Reach ID	
Perennial stream	HSA stream code		m	Name_Reach ID	
Natural freshwater lake	Name/class		ha	Name	
Freshwater impoundment	Name/class		ha	Name	
Reservoir	Name/class		ha	Name	
Ditch	TBD		m	TBD	
Flume	TBD		m	TBD	
Drainage ditch	TBD		m	TBD	
Canal	TBD		m	TBD	

¹See Assessment Decision Table for explanation of waterbody types.

²Other coding systems that may be used/adapted include State of Hawaii Department of Land and Natural Resources Division of Aquatic Resources codes for streams and reservoirs.

TBD = To Be Determined

Monitoring and Assessment

Many of the data sets analyzed in this report provided insufficient quantity for listing/delisting decisions. Although this information was inadequate for HDOH purpose of decision-making, it should be publicly reported. The data within this report denoted as a question mark (?), reflect the fact that some data do exist, but not enough for the decision-making process. Waterbodies not listed in Assessment Decision Table reflect that no data was available.

Future sampling should focus on eliminating the legacy visual listings (V) persistent within this report. The ultimate goal is that all parameters are classified as Priority 1, and assigned not attained (N) or attained (A) designation. This would also include clarifying the Priority 2a and 2b sample sets of combined season data and the data sets between 5 and 10 where the resulting geomean is twice the standard. Concurrently, the next targeted group should be the waterbodies that have question marks (?). These waterbodies are identified as needing more data and should be sampled in the future. Waterbodies not on this listing at all, denote no data have been collected for assessment purposes, and sampling should begin. (These waterbodies should be listed in Assessment Decision Table and identified for future monitoring.) Waterbodies need to be rotationally included to ensure enough data is available within the floating 6-year window. Careful scheduling should allow for this targeted approach.

Additionally, in the future, Water Quality Standards need to be modified to ascertain designated use attainment with less time and financial resource input. Current standards identify general biological criteria and a more encompassing assessment of biological assemblages should gather more relevant data to determine whether designated uses are being attained. These modifications are subject to public comment and review and will be a long-term goal to bring the WQS into alignment with federal expectations.

C.3. Wetlands Program

There is no formal wetlands program in the State of Hawaii.

C.4. Trends Analysis for Surface Waters

There are no trends analysis computations available for surface waters in Hawaii developed by HDOH.

C.5 Public Health Issues

Leptospirosis Threat

Leptospirosis is not included as a water quality standard parameter. However, all freshwaters within the state are considered potential sources of Leptospirosis infection by the epidemiology section of the Hawaii State Department of Health. No direct tests have been approved or utilized to ascertain the extent of the public health threat through water sampling. Epidemiologic evidence has linked several illness outbreaks to contact with freshwater, leading authorities to issue blanket advisories for all fresh waters of the state.

Fish Consumption Advisory

Several locations have been identified and posted as areas where fish and shellfish should not be consumed. These areas include: Pearl Harbor, Ala Wai Canal and urban streams of Honolulu. Contamination of fish and shellfish include organochlorine pesticides and/or PCBs and lead.

PART D. GROUND WATER MONITORING AND ASSESSMENT

Ground water is reported in a separate chapter attached to this packet

PART E. PUBLIC PARTICIPATION

Ongoing informal public contact is a persistent component of HDOH's strategy. This report is a formal expression of the reporting requirements of the Clean Water Act. This report followed a regime of the standard public participation schedule. The first step consisted of the published formal call for data. This was accomplished on October 2, 2005 in 7 newspapers on all islands throughout the state. The final date for data submission was November 1, 2005. Additional public contact was made through e-mail and phone conversations to potential contributors of data and through e-mail broadcasts to e-lists of environmental professionals.

Once the report is in final draft form, a public notice will be published, with a 30-day comment period on the Draft. Public comments will be evaluated and edits to the report, and the Response to Comments document should be completed as soon as possible, for approval by the Deputy Director,

Environmental Health Administration. This package will then be sent to the U.S. EPA for approval.

LIST OF REFERENCES

Canadian Council of Ministers of the Environment (CCME). 1999. *Canadian Sediment Quality Guidelines for the Protection of Aquatic Life*. (<http://www.ec.gc.ca/ceqg-rcqe>).

Commission on Water Resources Management – State of Hawaii (CWRM) and the National Parks Service (NPS). 1990. *Hawaii Stream Assessment: A Preliminary Appraisal of Hawaii's Stream Resources*. Report R-84.

EPA – Watershed Branch. 2005. *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act (July 29, 2005)*.

Henderson, Katina and June Harrigan-Lum. 2002. *2002 List of Impaired Waters Prepared Under Clean Water Act (303(d))*. Hawaii State Department of Health.

Koch, Linda, June Harrigan-Lum and Katina Henderson. 2004. *2004 List of Impaired Waters Prepared Under Clean Water Act 303(d)*. Hawaii State Department of Health.

New York State Department of Environmental Conservation (NYSDEC), Division of Fish, Wildlife and Marine Resources. 1999. *Technical Guidance for Screening Contaminated Sediments*. (<http://www.dec.state.ny.us/website/dfwmr/habitat/seddoc.pdf>).

APPENDIX A: 2004 (& 2006) Priority Ranking and Listing/Delisting Criteria for Hawaii State Surface Waters
Compiled under Clean Water Act §303(d)/305(b) Integrated Report

Section 303(d) of the federal Clean Water Act requires states to list impaired waters every two years after reviewing “all existing and readily available water quality-related data and information” from a broad set of data sources and to submit this list to the U.S. Environmental Protection Agency (EPA). If previously listed waters are not listed on the subsequent list, “good cause” must be demonstrated on the basis of availability of newer and/or more accurate water quality data, discovery of past analytical flaws, or changes in conditions such as closing of a discharge pipe or implementation of major non-point source pollution controls.⁴

For the 2004 (& 2006) List, the Hawaii State Department of Health (HIDOH) screened available data according to listing criteria, below, that allow sorting of surface water quality data into one of three priority rankings for decision-making. Data evaluated at the end of the current listing cycle shall have been collected within the six-year period prior to each EPA-required submittal deadline. A six-year window was chosen to ensure that data reviewed for each listing cycle are both recent and available in sufficient quantity to warrant a statewide water quality data review. In the process of generating this list, the State is assuming that waterbodies meet water quality standards unless a weight-of-evidence approach shows otherwise.

The format of Hawaii's Water Quality Standards⁵ differs from other states' standards in that many of the criteria are expressed as geometric means of a representative data set, and are not intended for comparison with single sample values. The criteria contain allowances for rainfall events in the form of less strict "10 per cent" and "2 per cent" criteria. Because funding is limited for monitoring waterbodies in Hawaii, we use minimum sample size requirements to ensure a reasonable level of sampling of a waterbody over time and space. These sample sizes are not strict cutoffs, rather they are guides meant to systematize decision-making by the Department of Health in protection of environmental health and public health.

Data Sources:

Data from the following sources may be used for making listing or delisting decisions in addition to or instead of routine HIDOH Clean Water Branch sampling, provided that an acceptable written Quality Assurance/Quality Control (QA/QC) Plan or other documented data quality assurance process was utilized during sample collection and analysis and is available for review, if requested:

- 1) United States Geological Survey (USGS)
- 2) National Oceanic & Atmospheric Administration (NOAA)
- 3) Universities
- 4) Community groups, individuals & respondents to a published, statewide “Call for Data”
- 5) HIDOH Hazard Evaluation and Emergency Response Office (HEER)
- 6) Military
- 7) United States Fish and Wildlife (USFWS)
- 8) Superfund investigation and remediation projects
- 9) United States Department of Agriculture (USDA)

⁴ Federal regulations concerning the listing process can be found at 40 CFR Part 130.7.

⁵ State Water Quality Standards can be found at HAR 11-54.

- 10) Special projects by HDOH Clean Water Branch
- 11) Other government agencies
- 12) Environmental Assessments and Environmental Impact Statements
- 13) Consulting Firms
- 14) Private & public entities operating under water pollution control permits

Basic Data Quality Requirements for All Listing Priorities:

Acceptable written QA/QC documentation appropriate for the project, and containing descriptions of procedures used during sample collection and analysis, must be available for review, if requested.

Additional Data Quality Requirements for Listing Priority 1:

1. Photographs and written descriptions of the sampling sites are available upon request.
2. A general visual assessment of the water body that contains sufficient information to place the water body in the context of surrounding land uses and overall condition of the habitat is also available upon request.

Listing Priority 1:

Waters will be listed if these criteria are met for conventional pollutants such as total suspended solids, nutrients and temperature and toxic substances compiled in the Hawaii Administrative Rule, Chapter 11-54, Water Quality Standards:

1. For conventional pollutants, at least ten (10) samples per water body were collected and analyzed, the geometric mean⁶ of the data for a single waterbody exceeds the corresponding geomean criterion and at least one of the following requirements is met:
 - a. For streams, there must be at least two stations per stream (upper and lower) and at least five (5) samples per station.
 - b. For non-flowing fresh water bodies such as ponds and reservoirs, and for tidally-influenced water bodies such as estuaries and coastal waters, the samples must be distributed either on transects or randomly over the extent of the water body or section of water body sampled. In order to obtain a representative sample for evaluating water quality over the area of concern, not only at a single point, samples should be collected along onshore-offshore transects extending seaward at least 50 feet, or at randomly scattered points across the surface of the area of concern.
2. In order to independently evaluate the “10% of the time” and “2% of the time” numeric criteria, sample sizes for the 10% criteria must be 100, for the 2% criteria must be 500. For listing, calculations using these data sets must exceed the corresponding criteria.
3. For toxic substances, at least three samples per water body were collected and analyzed, and the sample geometric mean exceeded the corresponding numeric criterion listed in §11-54-04(a).

⁶ The concept of a geometric mean may seem confusing: the nth root of the product of n numbers. However, people use an “arithmetic” mean in every day life for averaging. Unlike an “arithmetic” mean, a “geometric” mean or “geomean” multiplies numbers rather than adding them to find an average. This method allows people to use geometric means when they have highly variable number sets and do not want a few high or low values to distort an average.

Listing Priority 2:

Waters may be listed if all data requirements under Listing Priority 1 are not met, provided that at least one of the following factors is met and sufficient site documentation is available:

1. For Conventional Pollutants,
 - a. At least ten (10) samples per water body were collected and analyzed, but wet and dry season data must be combined because insufficient sample sizes exist to evaluate the wet and dry standards separately (Note: if the geometric mean of this data only exceeds the dry season standard, a majority of the dry season sample values must exceed the dry season standard to warrant listing; however, if the geometric mean of this data exceeds both the wet and dry season standards, the waterbody may be listed for both wet and dry exceedances), this category is referred to as Priority Listing 2a.
 - b. The majority of sample values in a data set of 5 - 9 values for a single waterbody exceed the corresponding geometric mean criterion in the rule by a factor of 2 or more, this category is referred to as Priority Listing 2b.
 - c. Calculations with a sample size of 50 to 90 show exceedance of the corresponding "10% of the time" criterion or
 - d. Calculations with a sample size of 250 to 450 show exceedance of the corresponding "2% of the time" criterion.
2. The type of water quality problem identified is particularly severe (i.e., each of two measurements of a toxic substance is more than twice the corresponding water quality criterion). This category is referred to as Priority Listing 2c.
3. For narrative information, at least three sampling events are presented, direct correlations to the narrative criteria in 11-54-04 can be established and the narrative standards are not attained. Data sets for evaluation of narrative criteria must include at least 3 sampling events and represent conditions in both the wet and dry seasons. These narrative criteria may be evaluated using HDOH approved habitat or biological assessments as long as they can be directly correlated to specific narrative criteria in HAR 11-54-04. This category is referred to as Priority Listing 2d.
4. For toxic substances, at least three samples per water body for toxic substances were collected and analyzed; compute the sample geometric mean and compare to the narrative criteria listed in §11-54-04(a). Acute toxicity standards for sediment may be evaluated using broadly accepted standards such as those developed in Canada and New York, provided that HDOH deems them appropriate for use in the Hawaiian environment. This category is referred to as Priority Listing 2e.

Listing Priority 3:

These waters are considered a high priority for additional monitoring; data will be assessed at the end of the next listing cycle and a listing decision made at that time:

1. ≤ 5 sample values are available for conventional pollutants.
2. <3 sampling events for determination of toxic or narrative standard exceedances.
3. Other information is limited and inconclusive.

The Department of Health reserves the right to list waters within any priority category when dilution calculations, predictive modeling, historical data or other supporting information indicate probable exceedance of the water quality standards and/or a risk to public and environmental health. These determinations will be made based on a weight of evidence approach with input from the U.S. Environmental Protection Agency.

Delisting Criteria:

Waters may be delisted if the data show that water quality standards are attained, and the appropriate sample sizes and other information required under Listing Priority 1 are available.

APPENDIX B: Communications Summary**2006 Call for Data** EPO contact list

Contact Name	Affiliation	phone	email	Date contacted	method	DOH rep	Response
All State Newspapers				10/2/2005	paid ad	lk	n/a
Susan Miller	DBEDT			9/30/2005	email	lk	will post to elist
Bill Walsh	DLNR-DAR			9/30/2005	phone/email	lk	will post to elist
Dave Penn	HIDOH			10/2/2005	personal	dp	will post to TMDL elist
Mike Kido	UH-HSRC	956-0811		10/4/2005	phone	lk	will submit data if any
Martha Yent	DLNR- State Parks	587-0287		9/29/2005	meeting	lk	will look
Adam Asquith	SeaGrant	822-2190	asquith@hawaii.edu	10/20/2005	email	lk	no response
Reuben Wolff	USGS	587-2432		10/5/2005	phone	lk	see reports
Wendy Wiltse	EPA-Hawaii	541-2752		10/19/2005	phone	lk	referred new contacts
Ed Laws	UH	956-7402	elaws@hawaii.edu	10/20/2005	email	lk	sent data to June before
Jeff Burgett	FWS	792-9472		10/7/2005	phone	lk	referred to G. Smith
Leticia Colmenares	WCC	236-9120	leticia@hawaii.edu	10/19/2005	email	lk	check her website for data
Dan Hoover	UH	956-2703	dhoover@hawaii.edu	10/18/2005	phone	lk	will check
Curt Storlazzi	USGS		cstorlazzi@usgs.gov	10/18/2005	email	lk	sent references
Maqs Alam	UH	956-8121	alam@hawaii.edu	10/19/2005	email	lk	no response
Joanne Leong	UH-HIMB	236-7401	joannleo@hawaii.edu	10/18/2005	email	lk	no response
Roger Fujioka	UH	956-3096	rfujioka@hawaii.edu	10/20/2005	email	lk	no response
Phil Moravcik	WRRRC	956-3097	morav@hawaii.edu	10/19/2005	email	lk	does monitoring for city outfalls
Dick Brock	UH	956-2859	brockr@hawaii.edu	10/17/2005	phone	lk	will compile and send
Steve Dollar	UH	956-7631	dollar@hawaii.edu	10/17/2005	phone	lk	left message then emailed
Fred Mackenzie	UH	956-6344	fredm@hawaii.edu	10/20/2005	email	lk	no response
Ross Sutherland	UH	956-3524	sutherla@hawaii.edu	10/20/2005	email	lk	no response
Mike Fitzsimmons	LSU		fitzsimons@lsu.edu	10/20/2005	email	lk	no response
Carl Berg	Hanalei Hui			10/17/2005	email	lk	will send new data
Gordon Smith	FWS	792-9457		10/17/2005	phone	lk	no data
David Ziemann	Oceanic Institute	259-7951		10/19/2005	phone	lk	no response
Isabella Abbot	UH	956-8073		10/17/2005	phone	lk	will talk to grad student
Randy Bartlett	Maui Land & Pine		rtb@lava.net	10/20/2005	email	lk	no response
Pi'i La'eha	Maunalani Resort	885-6677		10/20/2005	phone	lk	will look no data sent

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2006 Call for Data EPO contact list

Contact Name	Affiliation	phone	email	Date contacted	method	DOH rep	Response
Nelson Aires	DLNR	587-4175		10/17/2005	phone	lk	no data to submit
Sam Gon	Nature Conservancy	537-4508		10/17/2005	phone	lk	left message/ no response
Mike Parsons	UHH	933-3903	mparsons@hawaii.edu	10/20/2005	email	lk	no response
Ceilia Smith	UH Botany	956-6947		10/21/2005	phone	lk	no answer
Christina McGuire	UH		mcguirec@hawaii.edu	10/20/2005	email	lk	out of the office til 11/5
Don Heacock	DAR	645-0532		10/20/2005		lk	will try to send info
Mike Yamamoto	DAR	587-0087		10/21/2005		lk	no response
Glenn Higashi	DAR	587-0112		10/21/2005		lk	no response
Allison Sherwood	UH		asherwoo@hawaii.edu	10/20/2005	email	lk	no response

APPENDIX C: Data Received for Consideration

Log of Data Received for 2006 Integrated Report

Submitted By

No.	Waterbody Type (Estuary, Embayment, Coastal, Oceanic)	Waterbody Name	Pollutants	Description of Data Pkg (Paper/Electronic, Data Format)	Last Name	First Name	Organization	Date Received	QA/QC Procedures (Y/N)	Geolocation (Y/N)	Pictures (Y/N)
2006-001	various	various	various	paper, 64 pp., notation: wqdo.hwk4	Brock	Richard	UH Manoa	? See Linda	?	maps of station locations, 12 pages	?
2006-002	embayment	Kauai Lagoon	various	paper, 22 pp	Tagawa	Walter	GACI-FM	12/9/2004		map of station locations, 1 p.	?
2006-003	various	various	various	paper, 45 pp, notation: DMR's through June 2005	?	?	CWB	?	?	?	?
2006-004	embayment	Kauai Lagoon	various	paper, 40 pp.	Tagawa	Walter	GACI-FM	10/28/2004	?	map of station locations, 1 p.	?
2006-005	embayment	Hulopoe-Manele Bay Golf Course	various	paper, 137 pp.	Matsuda	Ralph	Castle & Cooke Resorts, LLC	10/13/2005 10/14/2005 (duplicate to separate addressee)	?	map of station locations	?
2006-006	coastal	Wailoa Small Boat Harbor	various	paper, 69 pp. (p. 10 missing); duplicate 16 pp., includes p.10	Clarence	?	?	06/20/2005 10/03/2005 (partial duplicate sent)	?	map of station locations	Y
2006-007	coastal	Makena Resort/Golf Courses	nutrients	paper, 40 pp. Report 2-2003	?	?	Makena Resort Corp.	5/11/2004	?	photo map of station locations	?
2006-008	coastal	Makena Resort/Golf Courses	nutrients	paper, 38 pp. Report 1-2004	?	?	Makena Resort Corp.	8/25/2004	?	photo map of station locations	?

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Submitted By

No.	Waterbody Type (Estuary, Embayment, Coastal, Oceanic)	Waterbody Name	Pollutants	Description of Data Pkg (Paper/Electronic, Data Format)	Last Name	First Name	Organization	Date Received	QA/QC Procedures (Y/N)	Geolocation (Y/N)	Pictures (Y/N)
2006-009	embayment	Kauai Lagoon	various	paper, 29 pp.	Tagawa	Walter	GACI-FM	2/3/2005	?	?	?
2006-010	embayment	Kiholo Bay	various	paper, 7 pp.	Busch	Georgine	The Earl & Doris Bakken Foundation	7/21/2004	?	map of station locations, 1 p.	?
2006-011	embayment	Hulopoe Bay	various	paper, 119 pp.	Brock	Richard	Environmental Assessment Co.	11/21/1996	?	map of station locations, 1 p.	?
2006-012	embayment	Hulopoe Bay & Manele Bay	various	paper, 67 pp.	Brock	Richard	Environmental Assessment Co.	7/29/1999	?	map of station locations, 1 p.	?
2006-013	coastal	Waikoloa Resort	various	paper, 89 pp.	Rohr	Thos	Waikoloa	6/24/2005	?	map of station locations, 1 p.	?
2006-014	coastal	Waikoloa Resort	various	paper, 86 pp.	Rohr	Thos	Waikoloa	10/15/2004	?	map of station locations, 1 p.	?
2006-015	embayment	Hulopoe Bay & Manele Bay	various	paper, 124 pp.	Brock	Richard	Environmental Assessment Co.	11/5/1999	?	map of station locations, 1 p.	?
2006-016	embayment	Hulopoe Bay & Manele Bay	various	paper, 124 pp.	Brock	Richard	Environmental Assessment Co.	3/24/2000	?	map of station locations, 1 p.	?
2006-017	embayment	Hulopoe Bay & Manele Bay	various	paper, 118 pp.	Brock	Richard	Environmental Assessment Co.	12/8/1999	?	map of station locations, 1 p.	?

Log of Data Received for 2006 Integrated Report

Submitted By

No.	Waterbody Type (Estuary, Embayment, Coastal, Oceanic)	Waterbody Name	Pollutants	Description of Data Pkg (Paper/Electronic, Data Format)	Last Name	First Name	Organization	Date Received	QA/QC Procedures (Y/N)	Geolocation (Y/N)	Pictures (Y/N)
2006-018	embayment	Hulopoe Bay & Manele Bay	various	paper, 127 pp. 2005-6A,B	Brock	Richard	Environmental Assessment Co.	3/4/2005?		map of station locations, 1 p.	?
2006-019	embayment	Hulopoe Bay & Manele Bay	various	paper, 128 pp. 2005-12A,B	Brock	Richard	Environmental Assessment Co.	6/28/2005?		map of station locations, 1 p.	?
2006-020	coastal	Makena Resort/Golf Courses	nutrients	paper, 32 pp. Report 1-98	?	?	Makena Resort Corp.	11/1/2005?		photo map of station locations	?
2006-021	coastal	Makena Resort/Golf Courses	nutrients	paper, 33 pp. Report 1-97	?	?	Makena Resort Corp.	11/1/2005?		photo map of station locations	?
2006-022	coastal	Makena Resort/Golf Courses	nutrients	paper, 31 pp. Report 2-96	?	?	Makena Resort Corp.	11/1/2005?		photo map of station locations	?
2006-023	coastal	Makena Resort/Golf Courses	nutrients	paper, 21 pp. Report 1-95	?	?	Makena Resort Corp.	11/1/2005?		photo map of station locations	?
2006-024	coastal	Makena Resort/Golf Courses	nutrients	paper, 33 pp. Report 2000	?	?	Makena Resort Corp.	11/1/2005?		photo map of station locations	?
2006-025	coastal	Makena Resort/Golf Courses	nutrients	paper, 34 pp. Report 2001	?	?	Makena Resort Corp.	11/1/2005?		photo map of station locations	?
2006-026	coastal	Makena Resort/Golf Courses	nutrients	paper, 34 pp. Report 1-2002	?	?	Makena Resort Corp.	11/1/2005?		photo map of station locations	?

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2006-027	coastal	Makena Resort/Golf Courses	nutrients	paper, 28 pp. Report 1-2003	?	?	Makena Resort Corp.	11/1/2005	?	photo map of station locations	?
2006-028	coastal	Makena Resort/Golf Courses	nutrients	paper, 39 pp. Report II-2004	?	?	Makena Resort Corp.	11/9/2005	?	photo map of station locations	?
2006-029	coastal	Makena Resort/Golf Courses	nutrients	paper, 37 pp. Report 2-99	?	?	Makena Resort Corp.	11/10/2005	?	photo map of station locations	?
2006-030	estuary	Enchanted Lake	organochlorine pesticides	paper, 34 pp.	?	?	HIMB/KBAC	12/1/2004	?	photo map of station locations	?
2006-031	embayment	Hulopoe Bay & Manele Bay	various	paper, and disk	Brock	Richard	Environmental Assessment Co.	11/1/2003	?	map of station locations, 1 p.	?
2006-032	Kona and Anchialine Pools	Kukio, Kona	various	paper, 58 pp. Report 2005-08	Brock	Richard	Environmental Assessment Co.	11/2/2003	?	map of station locations	?
2006-033	Streams, Estuaries, and Embayment	Hanalei Bay region	various	7 email files, and paper copied for AR	Berg	Carl	Hanalei Hui	11/1/2005	?	map of station locations	?
2006-034	coastal	Kaloko Honokohau	various	web report reference http://pubs.usgs.gov/of/2005/1161	Storlazzi	Curt	USGS	10/17/2005	Y	map of station locations	Y

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Submitted By

No.	Waterbody Type (Estuary, Embayment, Coastal, Oceanic)	Waterbody Name	Pollutants	Description of Data Pkg (Paper/Electronic, Data Format)	Last Name	First Name	Organization	Date Received	QA/QC Procedures (Y/N)	Geolocation (Y/N)	Pictures (Y/N)
2006-035	coastal	Honolua Bay	various	web report reference http://pubs.usgs.gov/of/2005/1068	Storlazzi	Curt	USGS	10/17/2005	Y	map of station locations	Y
2006-036	coastal	South Molokai	various	report reference Coral Reefs, v. 23, p. 559-569	Storlazzi	Curt	USGS	10/17/2005	Y	map of station locations	Y
2006-037	coastal	South Molokai	various	report reference Continental Shelf Research, v. 24(12), p. 1396-1419	Storlazzi	Curt	USGS	10/17/2005	Y	map of station locations	Y
2006-038	coastal	West Maui	various	web report reference http://pubs.usgs.gov/of/2004/1287	Storlazzi	Curt	USGS	10/17/2005	Y	map of station locations	Y
2006-039	Pearl Harbor estuary	Pearl Harbor	various	web report reference http://pubs.usgs.gov/of/2003/of03-430	Storlazzi	Curt	USGS	10/17/2005	Y	map of station locations	Y

Log of Data Received for 2006 Integrated Report

Submitted By

No.	Waterbody Type (Estuary, Embayment, Coastal, Oceanic)	Waterbody Name	Pollutants	Description of Data Pkg (Paper/Electronic, Data Format)	Last Name	First Name	Organization	Date Received	QA/QC Procedures (Y/N)	Geolocation (Y/N)	Pictures (Y/N)
2006-040	coastal	West Maui	various	web report reference http://pubs.usgs.gov/of/2003/of03-482	Storlazzi	Curt	USGS	10/18/2005	Y	map of station locations	Y
2006-041	coastal, estuaries, embayment, stream	various	various	website http://www.wcc.hawaii.edu/water	Colmenares	Letty	WCC	10/20/2005	Y	map of station locations	Y
2006-042	coastal	Ewa Beach	various	CD in pdf format/permit requirement			Haseko Ewa Inc.	12/5/2005?			